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Mini Review

Current practices in the clinical and psychometric assessment of internet gaming disorder in the era of the DSM-5: A mini review of existing assessment tools

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Introduction

As of May 2013, the American Psychiatric Association (APA) published the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) and introduced Internet Gaming Disorder (IGD) in the Section III (Emerging Measures and Models) of the DSM-5 [1] as a tentative disorder warranting further research before being included in future editions of the DSM and fully recognized as an independent clinical disorder [1,2]. Moreover, IGD is defined in the DSM-5 as a '*persistent and recurrent use of the Internet to engage in games, often with other players, leading to clinically significant impairment or distress*' (p. 795), as indicated by five (or more) of the following nine criteria: (i) preoccupation with games, (ii) withdrawal symptoms when gaming is taken away, (iii) tolerance, (iv) unsuccessful attempts to control the participation in games, (v) loss of interests in previous hobbies and entertainment as a result of, and with the exception of, games, (vi) continued excessive use of games despite knowledge of psychosocial problems, (vii) deception of family members, therapists, or other regarding the amount of gaming, (viii) use of games to escape or relieve a negative mood state, (ix) jeopardy or loss of a significant relationship, job, or education or career opportunity because of participation in games [1].

Previous studies [3-6] have shown how assessment tools and conceptual frameworks defining addictive gaming behavior prior the DSM-5 were inconsistent and how they hindered the field of the assessment of IGD. Therefore, several authors [3,5,7,8] have recently made a call to standardize and unify the assessment of IGD given that the field now has an objective set of criteria and preliminary conceptual framework defining the phenomenon that was put forth by an official medical body (i.e., APA). In light of this, a few psychometric and assessment tools (see Table 1) have been developed since then. To the best of the author's knowledge, the field of IGD has now a set of seven clinical and psychometric instruments based on the updated framework set by the APA to assess the phenomenon of addictive gaming behavior.

The recent proliferation of IGD assessment tools denote, in the one hand, that consensus on how to assess the disorder remains elusive. This is particularly noticeable by the development and publication of assessment tools that completely overlap with existing ones [e.g., 9], adding further confusion to the field. Notwithstanding this, Table 1 makes it clear that researchers are indeed attempting to move the area forward and further beyond its '*unofficial*' status since most of the newly developed assessment tools have consistently relied on the nine IGD criteria as the rationale for devising such instruments [9-12]. On the other hand, however, such studies are bound to provide potentially meaningful evidence in the near future either in favor or against the way in which IGD is defined and conceptualized by the APA, allowing new evidence-based criteria and models to emerge and fill in potential gaps [13-15].

Although the field of IGD is still in its early infancy, based on the latest progresses the field have witnessed, the following recommendations are made to help move forward and improve future research on IGD: (i) more scientific scrutiny is needed on each IGD criterion in terms of the impact and weight they may carry towards the final diagnosis, (ii) existing assessment tools would greatly benefit from further clinical studies utilizing actual clinically diagnosed samples so more concrete information on the validity and diagnostic properties (e.g., sensitivity, specificity, negative and positive predictive values) of these tools could be gathered, (iii) acquiring further longitudinal evidence on IGD is paramount for understanding the potential etiological mechanisms and clinical course of the disorder, such studies might provide useful evidence supporting the recognition of IGD as an official disorder, and (iv) large-scale nation-wide studies using probability samples and the already available new standardized psychometric tools are needed in order to estimate robust prevalence rates of IGD that can then be contrasted with prevalence rates found elsewhere, and that can be reliably be used by governmental bodies and other stakeholders in the process of policy making and development of adequate treatment protocols needed for this disorder [16,17].

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Table 1. Current available psychometric and clinical assessment tools to evaluate Internet Gaming Disorder (IGD) according to the American Psychiatric Association's conceptual framework.

Instrument	Number of items	Type of scale	Time-scale	Addiction criteria	Clinical validation	Cross-cultural validation
The Internet Gaming Disorder Test (IGD-20 Test) [10]	20	Continuous	12-month	Scoring ≥ 71 points	No	Spain [11]
Internet Gaming Disorder Scale–Short-Form (IGDS9-SF)[12]	9	Continuous	12-month	Endorsing ≥ 5 criteria[a]	No	Portugal [13] and Slovenia [14]
The Internet Gaming Disorder Scale (IGDS) [15][b]	27	Dichotomous and Continuous	12-month	NR	No	No
The Internet Gaming Disorder Scale (Short Scales)[15][b]	9	Dichotomous and Continuous	12-month	Endorsing ≥ 5 criteria	No	No
The Ten-Item Internet Gaming Disorder Test (IGDT-10)[16]	10	Ordinal	12-month	Endorsing ≥ 5 criteria[c]	No	No
Clinical Assessment Tool (C-VAT 2.0) [17][d]	14	Dichotomous[e]	12-month	Endorsing ≥ 5 criteria[f]	Yes	No
The Personal Internet Gaming Disorder Evaluation-9 (PIE-9)[9]	9	Continuous	12-month	Endorsing ≥ 5 criteria[g]	No	No

[a]A criterion is endorsed when a participant provides the maximum response possible in that item (*i.e.,* 'Very often').
[b]Both the IGDS and its shorter version were developed in the same study.
[c]Endorsement of each criterion is assessed upon conversion of the original three-point response scale (*i.e.,* "never", "sometimes", and "often") each item into yes/no
[d]The C-VAT 2.0 is a clinical assessment tool, therefore its administration is made by a trained clinician
[e]Only the nine items referring to the nine IGD criteria
[f]In terms of diagnosis, only the nine items referring to the nine IGD criteria are considered in the diagnostic process
[g]A criterion is endorsed when a participant respond with either 'Very often' or 'Often' to an item.

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